

Frese OPTIMIZER - pressure independent 4-pipe coil control unit

Application

Frese OPTIMIZER control unit, in conjunction with the associated hydraulic set provides a complete pressure independent balancing and control group for efficient and effective individual room or central-controlled energy management in 4-pipe systems, such as:

- Heating and cooling ceilings
- Convectors
- Decentralised ventilation units
- Fan coil systems
- Convection heating & cooling units

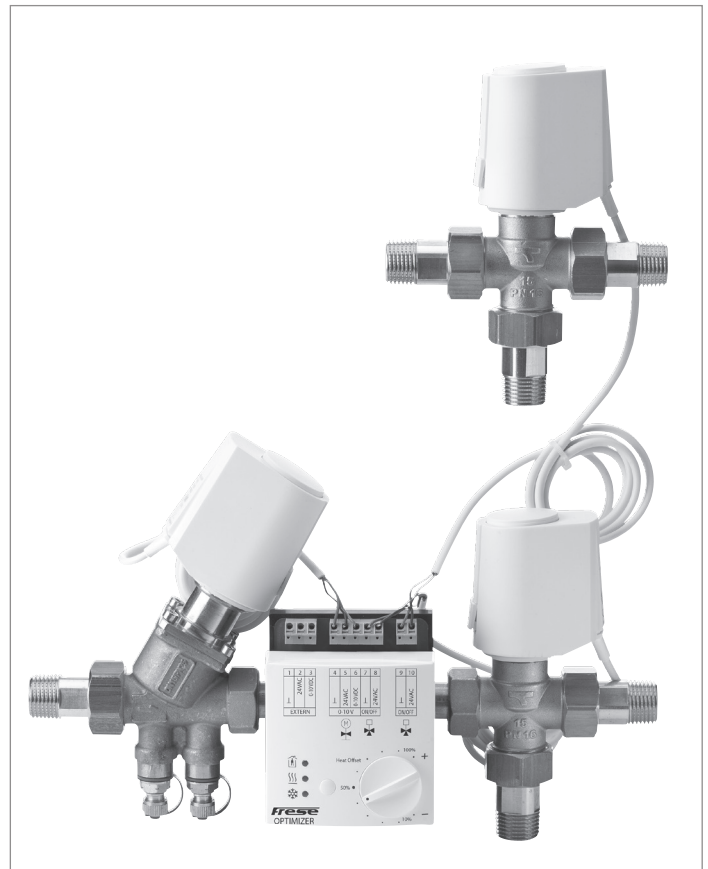
Frese OPTIMIZER provides modulating control, which works independently of any variations in the differential pressure of the system.

The hydraulic set consists of an OPTIMA Compact pressure independent control valve with a 0-10V modulating actuator, and two 3 port control valves with on/off actuators.

The heart of the hydraulic set is the OPTIMA Compact pressure independent control valve that always provides full valve authority with its combination of adjustable dynamic volume controller and modulating control valve.

Benefits

- Energy saving through optimum pressure-independent flow limitation and regulation
- Modulating control for both cooling and heating with only one data point
- No balancing valves required in the system
- Less time spent in the selection and sizing as only the data flow and min DP required
- Full comfort without recommissioning if the system is expanded during the construction phase
- Small space requirements for OPTIMIZER Control Unit
- Simple, flexible and quick installation due to separate components
- Individual or central room temperature control



Features

- The presetting function has no impact on the stroke; Full stroke modulation at all times, regardless the preset flow
- The constant differential pressure across the modulating control component guarantees 100% authority
- Automatic balancing eliminates overflows, regardless of fluctuating pressure conditions in the system
- Thermal actuator on/off and 0-10V, normally closed
- High flows with minimal required differential pressure due to advanced design of the valve
- Small dimensions due to compact housing
- Higher presetting precision due to stepless analogue scale

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Function

Frese OPTIMIZER controls both heating and cooling with only one single data point from the BMS system, through a 0 -10V external control signal (1).

Full modulation is provided with even different design flow of heating and cooling.

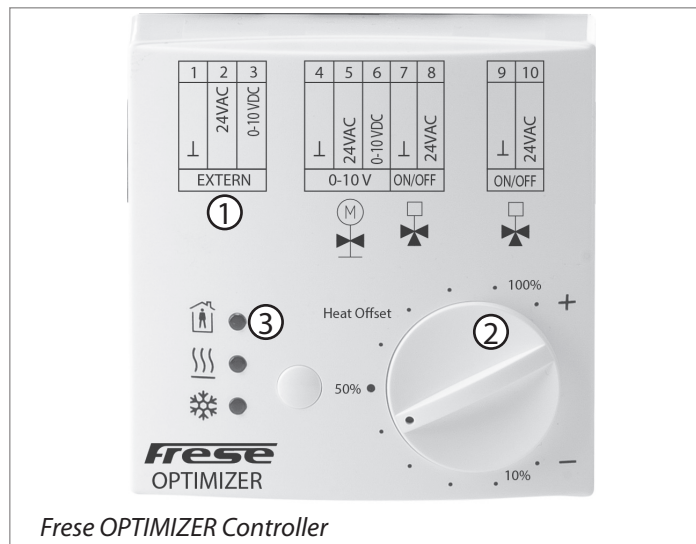
The design flow rate for the cooling system defines the maximum flow through the coil and is set using the Pressure Independent 2 way Control Valve, Frese OPTIMA Compact (see page 5).

Frese OPTIMIZER Controller offers setting of hot water flow, from 100% down to 10% of the maximum flow. The Heat Offset flow can be set using the dial on the Frese OPTIMIZER Controller (2) - each dot indicates 10% of maximum flow.

The switch over from cooling to heating is automatically changed via the signal from the BMS data point.

The pressure in the heating and cooling system must be the same to achieve correct function. Max 100 kPa in pressure difference.

Frese OPTIMA Compact pressure independent control valve is closed during the switch over and remains closed for approx. 12 minutes until switching of the 3 port control valves has been safely completed. The switch over condition is signaled by the flashing of the Off-LED lamp. (3)

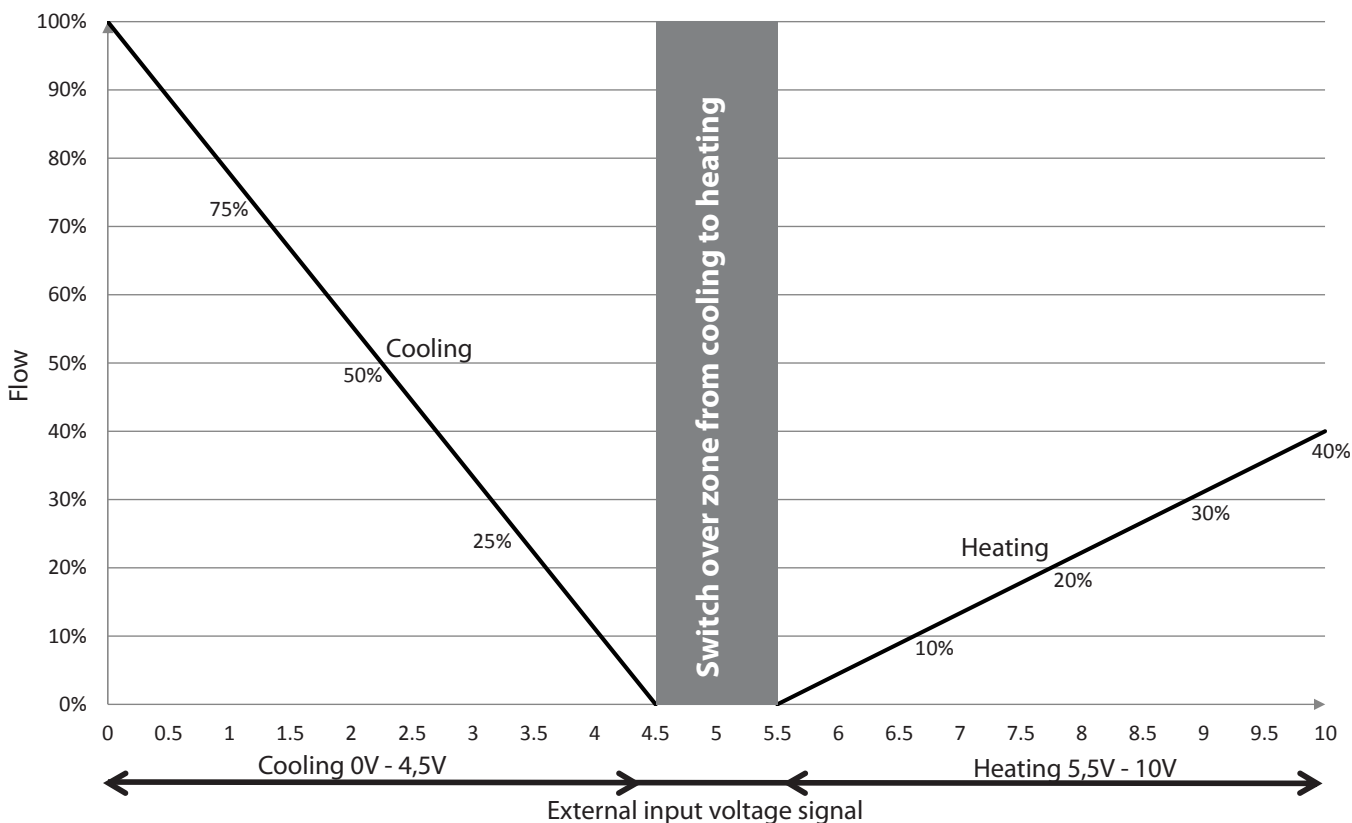


Frese OPTIMIZER Controller

Technical data Frese OPTIMIZER Controller

Protection class:	IP 30 to EN 60529
Supply:	24V AC (max. 25 VA)
Control signal:	0-10V DC
Ambient operating conditions:	10°C to 40°C 20-90% RH
Weight:	168 g

Example with Heat Offset at 40% flow



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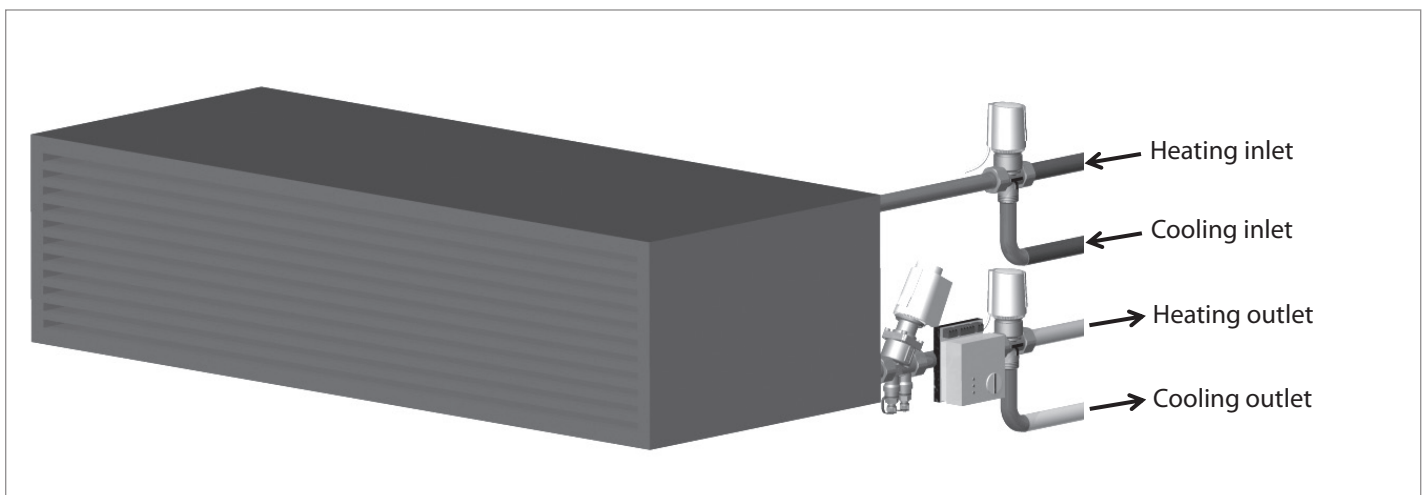
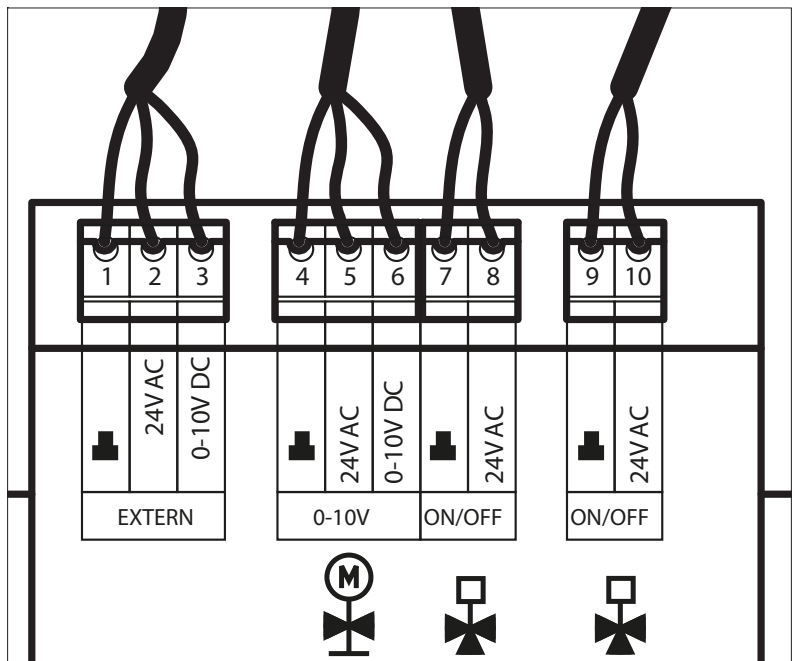
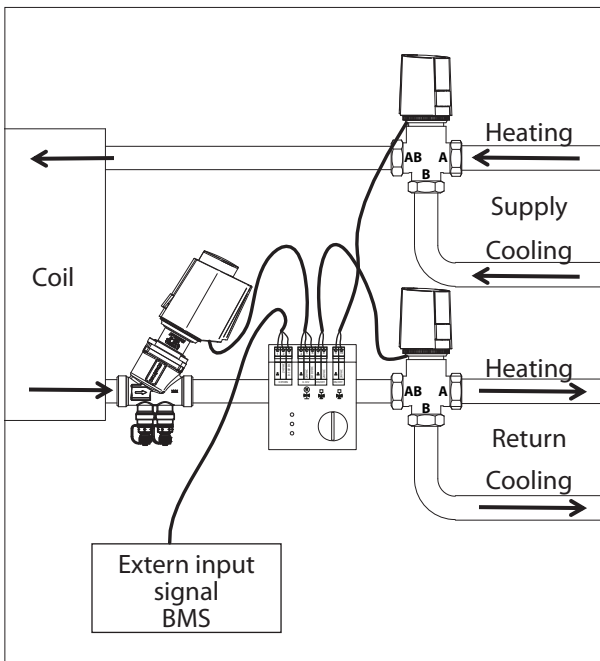
Technical data actuators

Characteristics:	Thermo actuators, normally closed
Protection class:	IP 54 to EN 60529
Frequency:	50/60 Hz
Control signal:	0-10V DC or on/off
Actuating force:	100 N
Stroke:	max. 5.5 mm
Running time:	120 s 0-10V/180 s on/off
Ambient operating conditions:	0°C to 60°C
Cable length:	1.0 m
Weight:	100 g



On/Off actuator 2.5 mm stroke, 24V AC-DC/ 180s NC (DN15)	48-5525
On/Off actuator 2.5 mm stroke, 24V AC-DC/ 180s N0 (DN25)	48-5531
Modulating actuator 2.5-5.0-5.5 mm stroke 24V AC/0-10V DC 30 s/mm	48-5529

Hydraulic connection and electrical wiring



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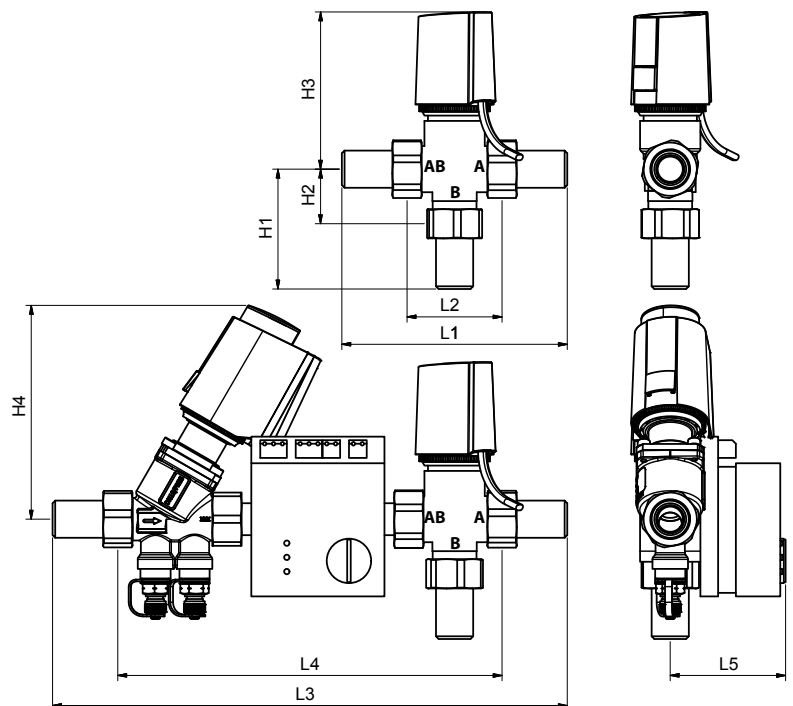
Technical data OPTIMA Compact

Valve housing:	DZR Brass, CW602N
DP controller:	PPS 40% glass
Spring:	Stainless steel
Diaphragm:	HNBR
O-rings:	EPDM
Pressure class:	PN25
Max. differential pressure:	800 kPa
Medium temperature range:	0°C to 120°C

Technical data 3 port control valve

Valve housing:	Cast Brass, CW617N
O-rings:	EPDM
Pressure class:	PN16
Medium temperature range:	0°C to 120°C
Kvs	2,5 DN15 5,5 DN25

The pipe system shall be properly ventilated to avoid risk of air pockets. Glycolic mixtures up to 50% are applicable (both ethylene and propylene). Frese A/S can accept no responsibility if another actuator is used instead of the Frese actuator



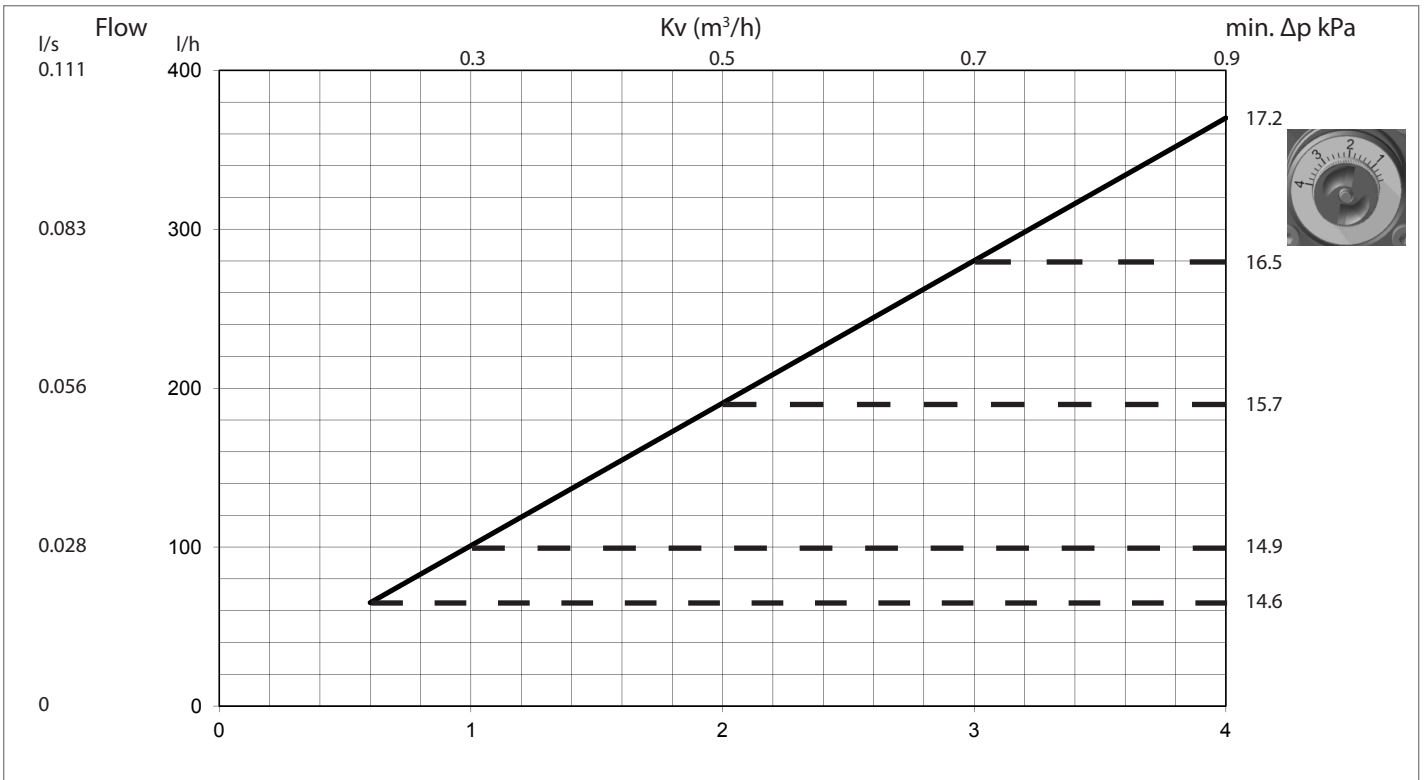
Dimension

Size		DN15	DN25
Length	L1	113	156
	L2*	56	76
	L3	276	354
	L4*	219	274
	L5	65	68
Height	H1	59	78
	H2*	30	38
	H3	89	100
	H4	120	139

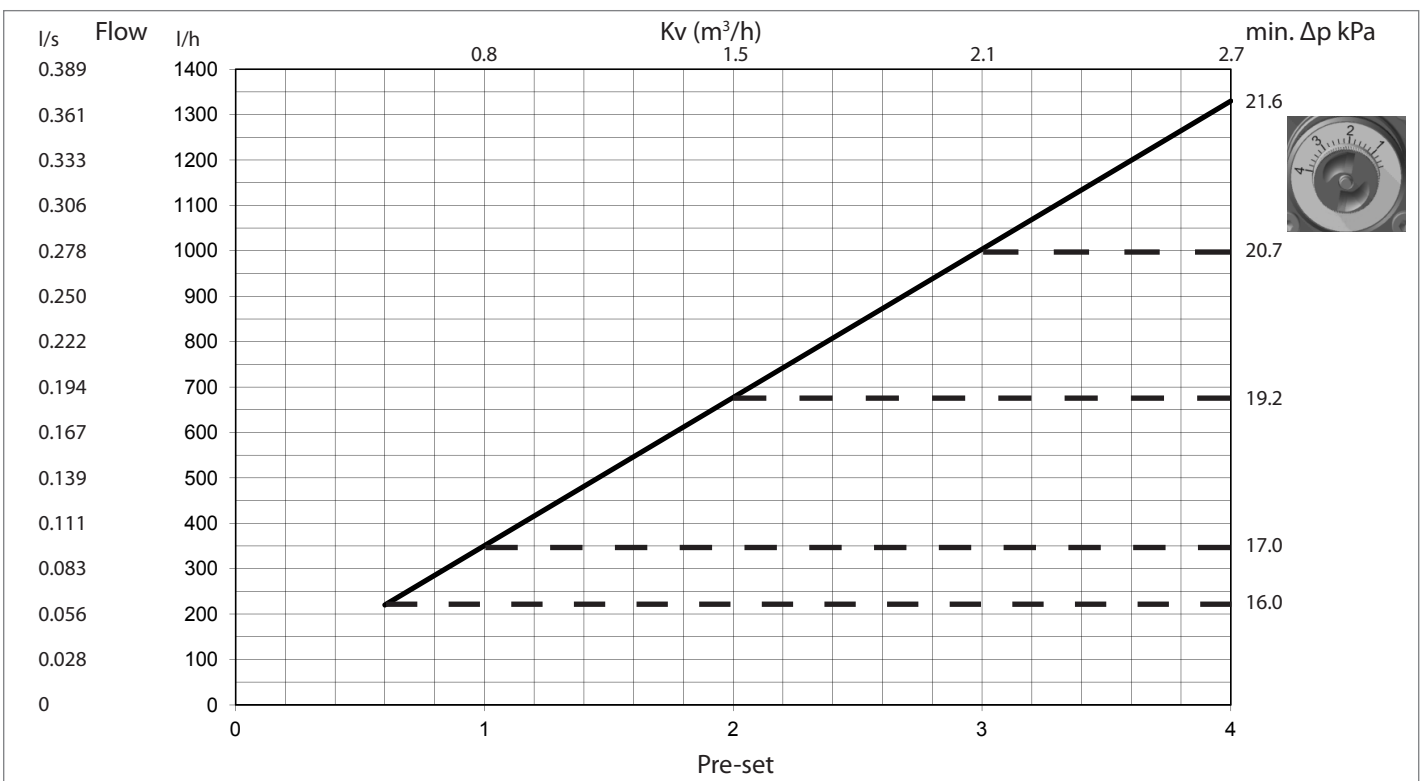
*) Dimensions without Couplings

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Frese OPTIMA Compact Low 5.0 DN15



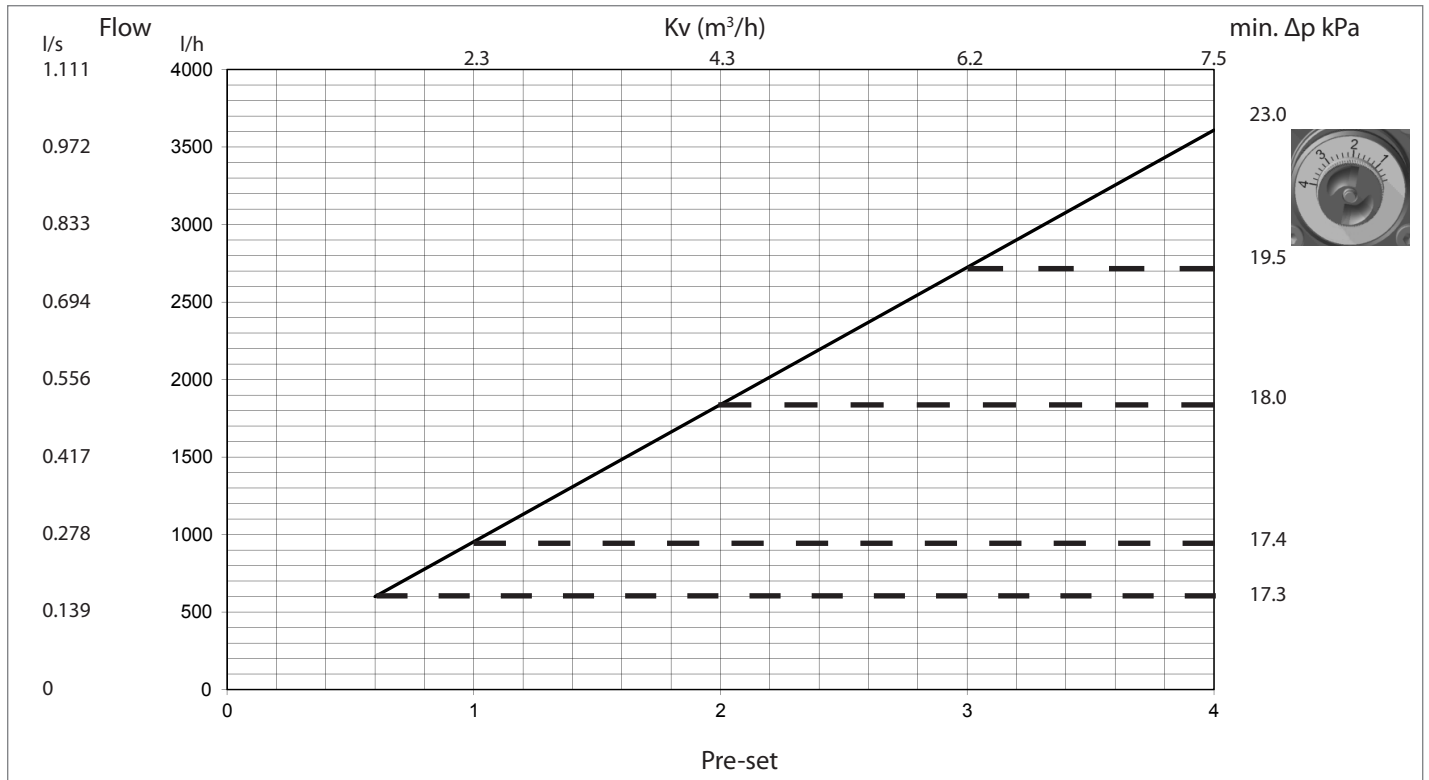
Frese OPTIMA Compact High 5.0 DN15



For further details: See OPTIMA Compact Technote

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Frese OPTIMA Compact High 5.5 DN25L



Product programme OPTIMIZER Control Unit

	Size	Type	Flow l/h	Item no.
	DN15	Frese OPTIMIZER Low Flow incl. couplings	65-370	53-1800
		Frese OPTIMIZER High Flow incl. couplings	200-1330	53-1801
	DN25	Frese OPTIMIZER incl. couplings	600-3609	53-1804
	DN15	Frese OPTIMIZER Low Flow	65-370	53-1802
		Frese OPTIMIZER High Flow	200-1330	53-1803
	DN25	Frese OPTIMIZER	600-3609	53-1805

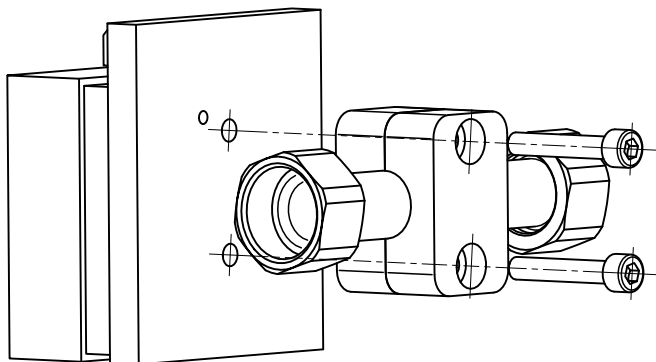
Product programme OPTIMA Compact for OPTIMIZER Control Unit

	Size	Type	Flow l/h	Item no.
	DN15	OPTIMA Compact 5,0mm Low	65-370	53-1330
		OPTIMA Compact 5,0mm High	200-1330	53-1325
	DN25L	OPTIMA Compact 5,5mm High	600-3609	53-1333

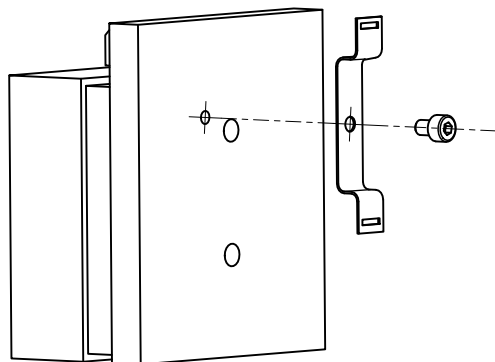
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Mounting of Frese OPTIMIZER Controller

Frese OPTIMIZER controller can be mounted either on the pre-insulated pipe using the pipe connectors or on a DIN rail using the DIN rail clips. (DN25 only with DIN rail clips)



Frese OPTIMIZER Controller mounted with pipe connector on the pre-insulated pipe



Frese OPTIMIZER Controller mounted with DIN rail mounting clips

Text for technical specifications

System specifications:

The system shall contain a modulating control for both heating and cooling, with only one data point from the external BMS system.

The maximum flow for cooling shall be set on the pressure independent control valve and the heating flow shall be set on the Controller in the range from 100% to 10% of maximum flow.

The system shall consist of 1 pcs. Controller mounted on a pipe connection with unions, 1 pcs. pressure independent control valve, 2 pcs. 3 port control valves, 1 pcs. 0-10V modulating actuator, 2 pcs. on/off actuators.

Pressure independent control valve specifications:

The length of the modulating stroke shall be independent of flow setting.

The modulation and flow setting shall be one combined unit with a linear modulating motion and a rotational flow setting motion.

The valve characterization shall not be changed at different flow settings.

The pressure independent control valve shall contain a combined flow setting, differential pressure control and modulating bonnet assembly.

The valve shall have an external adjustable analogue step less presetting scale from minimum to maximum flow.

The valve shall be capable of closing against a maximum differential pressure of 700 kPa (6 bar) DN15 and 800 kPa (8 bar) DN25 with a leakage rate at maximum 0,01% of max rated volumetric flow and comply to EN1349 Class IV.

The pressure independent control valve shall have a maximum operating differential pressure of 800 kPa (8 Bar)

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